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work-bench ; a similar ring *o* being put into the end of a handle of suitable length, is to be passed over the pipe, so that the part where the bend is to be shall be between the two rings. Gradual pressure being then made by means of the handle, the pipe yields and bends but cannot break, for the rings yield as well as the pipe ; and being of considerably softer material, will give way to any dangerous degree of pressure rather than the pipe ; so that bends can thus be made with little risk, much sharper than any prudent workman would attempt by the usual modes. When the tube has been bent, the solder is to be melted out, but enough remains in the joint to secure it.

In treating brass pipes as above, they must be previously tinned inside, in order to secure a perfect union between the tube and the core of solder.

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No. V.

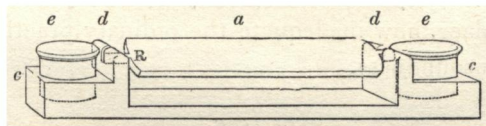
SWING HONE.

*The Thanks of the Society were voted to Mr. J. FAYRER, of 40, White Lion Street, Pentonville, for his Swing Hone for sharpening Razors and other Articles of Cutlery. One of the Hones has been placed in the Society's Repository.*

THE exquisite edge given by the cutler to razors, lancets, and other fine-cutting instruments, can rarely be produced by those persons who are in the habit of using them. This arises partly from ignorance of the properties in which consists the difference between a good and a bad

hone, and partly from want of that skill and slight of hand in the use of a hone, which long and constant practice only can give in perfection. Mr. Fayrer's hone is a plate of brass *a* about an inch wide and of any convenient length, ground to a perfectly smooth surface on both sides, one of which is marked *r* and the other *s*; part of each end is cut or filed away, leaving only two pins, or pivots, on which the hone turns or swings. In the frame *c c* are two uprights *d d* with notches to receive the pivots; *e e* are two boxes, one to hold a coarser and the other a finer powder made of oil-stone ground down and washed over: for the latter, finely pounded water-of-Air-stone may be conveniently substituted.

To use the hone, first place the side marked *r* uppermost, and put on it a few drops of oil and a little of the rougher or coarser powder, then draw along it, in the usual manner, the edge of the razor or other tool to be sharpened. As the hone swings on two pivots, the surface necessarily applies itself quite evenly along the edge of the blade, in whatever direction the pressure of the hand is made that holds the tool; and the particles of the powder, as the operation proceeds, are continually becoming smaller and smaller, and therefore giving a finer and finer edge to the tool or blade. To finish the setting, turn uppermost the surface of the hone, marked *s*, apply to it oil and the finer powder, and proceed as before.



Metal plates, both of steel and of tin, have already been made to serve the purpose of hones; but the application of brass as a material for this purpose seems to be

new, as well as the contrivance of hanging it on pivots, in order to accommodate itself to the varying pressure of the hand.

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No. VI.

ON WORKING IRON AND STEEL.

*The Thanks of the Society were presented to C. VARLEY, Esq. of 1, Charles Street, Clarendon Square, for the following paper.*

THE Society having favourably received the description of my late uncle's method of condensing brass, in which I endeavoured to shew the conditions which are requisite for the *extreme* and *uniform condensation* of metal previously sound; and knowing of how much consequence it would be to secure the soundness of anchors, iron ties, girders, and other implements, to which the safety of human life and property are so often trusted, I am encouraged to pursue the subject, and endeavour to shew the means by which iron or steel may be rendered sound, and preserved so while working, and even during welding. But on a subject supposed to be so well known, and in which I must repeat much that is known, for the sake of connexion, it may be well to justify myself by shewing, in the first place, how inadequate the ordinary practice is to prevent unsoundness.

*On Iron.*

The welding of numerous layers of good iron together, so as to form one bar, is considered to render it much tougher and more trustworthy than if it had been wrought